YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF APPLIED ECONOMICS
MASTER OF PUBLIC ADMINISTRATION PROGRAMME

AN ANALYSIS ON SAFETY MEASURE IN CONSTRUCTION INDUSTRY OF MYANMAR

(Case Study: Kyan Sit Min Housing Project, Hlaing Tharyar Township)

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EMPA - 76 (18th BATCH)

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A thesis submitted as a partial fulfillment towards the requirement for the degree of Master of Public Administration (MPA)

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This is to certify that this thesis entitled **"AN ANALYSIS ON SAFETY MEASRURE IN CONSTRUCTION INDUSTRY OF MYANMAR (Case Study: Kyan Sit Min Housing Project, Hlaing Tharyar Township)"**, submitted as a partial fulfillment towards the requirements for the degree of Master of Public Administration has been accepted by the Board of Examiners.

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ABSTRACT

The study is analyzed on safety measure in construction industry especially the Kyan Sit Min Housing Project in Hlaing Tharyar Township, Yangon Region in Myanmar. The objectives of the study are to identify the safety status of housing construction site and to examine the knowledge, attitude and practice of safety materials and personal protective equipment (PPE) among workers. The survey is conducted on 250 construction site workers with the self-structured questionnaire. Within the total respondents, the majority of respondents have less than one year worked experience in the construction site and are unskilled workers. The majority of respondents have understood some questions such as reporting every accident to duty officer, keeping for working places, disposing unnecessary things and waste properly, not to drinking alcohol, not to smoking in the working area, and wearing personal protective equipment (PPE). However, they have poor knowledge of most questions about safety of construction site. The construction companies do not provide PPE for using at workplace and no rules and regulation for safety in the construction site. Overall, most respondents did not show clearly favorable on knowledge, attitude and practice toward the safety of construction site. The study suggests that the companies/employers need to assess workplace hazards to identify the suitable type of PPE for their workplace. Since more and more construction projects are about to be implemented in Myanmar now and in future, occupational safety of the people involved in the construction industry should be paid more attention to improve the existing knowledge, attitude and practice of safety measure in construction site.

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LIST OF ABBREVIATIONS

BCC	Building Complete Certificated
BDS	Back Drainage System
CHID	Construction, Housing & Infrastructure Development
DUHD	Department of Urban and Housing Development
ILO	International Labor Organization
ISIC	International Standards Industrial Classification
MCEF	Myanmar Construction Entrepreneurs Federation
MLCA	Myanmar Licensed Contractors Association
NHP	National Housing Policy
PPE	Personal Protective Equipment
PPP	Public Private Partnership
STOP	Safety Training Observation Program
UN	United Nation
UNEP	United Nations Environment Programme
YCDC	Yangon City Development Committee

CHAPTER I
INTRODUCTION

1.1 Rationale of the Study

The housing construction industries are widely practiced in developed and developing countries. The housing construction industry provides important support in the development of the nation's socio-economic life. Its importance is mainly due to its direct and indirect effects on all operations.

The housing construction industry is a business related to economic development. The housing construction industry notes that approximately one-tenth of the global economy is dedicated to building and operating homes and offices (UNEP, 1996). It contributes to employment, generates income for the population, and has multiple effects on the economy.

Most of the workers in the housing construction industry are unskilled. Women find employment opportunities in the construction industry. In developing countries, workplace safety standards are even worse. Construction workers may be temporarily off the job due to injuries or health problems after working on a construction site. If the worker encounters this problem, age, Money and body parts can be lost.

Recent advances in technology in developed countries have on the one hand positively contributed to industrial productivity, but on the other hand, it has created a more challenging and unsafe work environment. Every construction worker is likely to become unfit for work at some point due to significant injuries or health problems after working on a construction site.

Developed countries use different technologically advanced materials and personal protective equipment (PPE) like safety shoe, belt because, they are exposed to different problems. If the labor exposed to such problem they may lose their life, money

and body part. Because an injury to a worker or workers results in the loss of necessary economic benefits from the individual worker or workers.

Since more and more housing construction projects are about to be implemented in Myanmar now and in future, more attention must be paid to the occupational safety and security of those involved in the housing construction industry in Myanmar. Today, Myanmar is experiencing different housing construction industries such as public housing construction industry and private housing construction industry.

The housing construction industry safety problems are becoming major challenges in Myanmar because of low occupational hazards awareness, lack of workplace health and safety policy and inefficient safety management systems.

The study is conducted to evaluate the knowledge, attitude and practice among construction workers at the Kyan Sit Min Housing Project in Hlaing Tharyar Township, Yangon Region, Myanmar.

1.2 Objective of the Study

The objectives of the study are: (a) to identify the safety status of housing construction site in Yangon Region, Myanmar and (b) to examine the knowledge, attitude and practice of safety materials and personal protective equipment (PPE) among workers from housing construction site in Yangon Region, Myanmar.

1.3 Method of Study

The study is descriptive method used to analyze the primary and secondary data. Primary data is collected with the self-structured questionnaire from the randomly selected 250 construction site workers in Kyan Sit Min Housing Project, Hlaing Tharyar Township, Yangon Region. Secondary data is obtained from Department of Urban and Housing Development under Ministry of Construction, Yangon City Development Committee, relevant documents on libraries and internet websites.

1.4 Scope and Limitations of the Study

This study intends to analyze the safety performance among construction site workers in Yangon Region, Myanmar. The survey is mainly focused on 10% of 2500 workers and collected 25 construction workers per day at Kyan Sit Min Housing Construction Site in Yangon Region during November 20 to 30, 2022. The study is only on knowledge, attitude and practice of the construction workers in Kyan Sit Min Housing Construction Project, Hlaing Tharyar Township, Yangon Region.

1.5 Organization of the Study

This thesis is organized into five chapters. Chapter one is introduction with rationale of the study, objectives of the study, method of study, scope and limitation of the study, and the organization of the study. Chapter two is literature review on construction industry, safety of construction and structures, safety management systems and factors affecting safety performance. Chapter three presents on public housing construction in Yangon Region. Chapter four is analyzing the collected survey data such as survey area profile, survey design and survey result. Finally, chapter five which involves findings and suggestions.

CHAPTER II
LITERATURE REVIEW

2.1 Construction Industry

According to UN (1996) International Standards Industrial Classification (ISIC), construction is defined usually as an economic activity engaged to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams, etc.

The industry includes an organization engaged in one or more of the following activities: site preparation, building of complete constructions or parts thereof, civil engineering; Building installation, building completion and renting of construction or demolition equipment with operators (Tam, Zeng and Deng, 2004). The industry includes all construction activities, whether carried out by private or public construction companies, whether under contract or on own account.

The construction industry is an economic sector that transforms various resources into physical economic and social infrastructure necessary for socio-economic development. It embraces the process by which the said physical infrastructure are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished National Construction Council (2004-2005).

The construction industry is an economic investment and its relationship with economic development is well established. Several studies have highlighted the construction industry's significant contribution to national economic development (Myers 2013). According to Olanrewaju and Abdul-Aziz (2015), some argue that the extent of its contribution is not always clear. Others argue that the construction industry can be used to regulate the economy, and some differ (Olanrewaju, and Abdulaziz, 2015).

Some have argued that the contribution is limited to the short term. There are those who argue that it is economic growth that drives the construction industry rather than economic growth. This means that the construction industry is not the driver of economic development, but only follows the path determined by total economic growth. rate (Olanrewaju, and Abdulaziz, 2015). Among the major economic sectors, the importance of the construction industry is evident whether the country is underdeveloped or not. Whether it is developed or not, it is unique. consultants in industry; main contractors and subcontractors; equipment and parts manufacturers; plant and equipment suppliers; companies working as builders and traders; organizations and individuals include companies and individuals. Industry has close relationships with customers and financiers.

2.2 Safety in Construction Industry

Safety is defined as the state of being relatively free from harm, danger, injury or damage. Unsafe conditions in buildings under construction or in constructed structures may result from the failure of engineers to develop and implement structurally and environmentally sound designs. Carrying out construction activities in a safe manner at the workplace; or allowing conditions during service to exceed the structural capacity of the facility (Usmen, and Vilnits, 2015).

When such conditions prevail, there is a safety hazard and the result is an accident that causes injuries and deaths during construction (Ardeshir, Amiri & Mohajeri, 2014). Similarly, if a safety hazard exists in a structure in the form of overloading. This destabilizes the building in part or in whole and causes it to collapse. Loss of life and property are common consequences. The role of design and construction engineers is to anticipate and prevent these events (Usmen, and Vilnits, 2015).

Occupational safety is the identification and control of environmental and personal hazards in the workplace (Champoux and Brun, 2003). The industry's response to workplace safety incidents has naturally matured over time, and a variety of programs to promote a safety culture are now reasonably common in large organizations. Organizations have three main approaches to safety improvement: safety management systems; Behavior-based safety approaches and safety culture change

programs. These approaches are not mutually exclusive and in fact the most effective approach is a combination of all three (Dejoy, 2005). A brief overview of these approaches follows to provide background on practical approaches to safety management used in industry (Sarah, 2015).

2.2.1 Safety Management Systems

The development of safety management systems is a major focus for organizations seeking to improve their safety performance (Sarah, 2015). Safety management systems are structured processes for managing safety risk. Often incorporated into electronic business systems.

Guldenmund (2010) current academic points to the need to combine analytical and practical approaches and suggests that improvements in safety management systems will provide a future focus and framework for people to give meaning and direction to their safety activities. in particular, High-risk industries understand the importance of effective systems to manage risk (Sarah, 2015).

2.2.2 Behavior-based Safety Approaches

Behavior-based approaches to safety have gained considerable popularity in the industry thanks to the well-known DuPont program 'STOP' (Safety Training Study Program; DuPont, 1991). A behavior-based safety approach has two opposing insights (Sarah. 2015). This tension seems to be quite uncomfortable and prompts people to reduce it by changing or rejecting one of the cognitions.

2.2.3 Safety Culture Change Programs

Safety culture programs are the latest trend in industrial approaches to safety management (Guldenmund, 2010). In contrast to behavior-based approaches; Safety culture approaches focus on articulating safety values through a top-down approach involving organizational leaders in the first instance (Sarah, 2015). rather than focusing specifically on individual behaviors; Safety culture aims to create a safety culture based on a comprehensive understanding of workplace safety performance or the causes of the lack thereof (Dejoy, 2005).

Safe and healthy working conditions do not happen by accident. Employers are required to have a written safety policy setting out safety and health standards for their business. A senior executive responsible for ensuring that policy meets standards; Management and supervisors at all levels should be named (ILO, 1995) with the authority to allocate responsibilities.

The safety policy should deal with the following matters:

- Activities for training at all levels. Actual care needs to be given to important workers such as scaffolds and crane operators whose mistakes can be especially dangerous to other workers;
- Safe methods or systems for hazardous operations: Workers who perform these operations should be involved in their preparation.;
- The duties and responsibilities of supervisors and important workers;
- Activities by which information on safety and health is to be made known;
- Activities for setting up safety committees;
- The selection and control of subcontractors.

The organization of safety on the construction site will be determined by the size of the work site, the system of employment and the way in which the project is planned and implemented. Safety and health records should be kept that facilitate the identification and resolution of safety and health problems at the site (ILO, 1995).

2.3 Safety Management in Construction Company

Construction company management considers safety as equally important as other aspects of the organization such as production and profitability. Security awareness of the company's top management is also required. It is important for top management to ensure that all employees follow safety procedures and improve their safety performance (Sagar and Rushabh, 2017).

To demonstrate their commitment to safety, top management provides the resources necessary to ensure employees can work safely and monitor safety; money Need to provide tools and equipment.

Management of construction company related factors are listed below:

- Safety awareness of company's upper-level management
- Conduction of safety policy review

- Safety awareness of project managers
- Issuing & operation of in-house safety rules, safety program or manuals including emergency plan & procedure
- Availability a clear company safety policy
- Management's attitude towards employee’s welfare

A construction company can employ several methods for designing and implementing safety programs. Some programs focus more on enforcing safety rules through an accountability system. Other programs include employee safety awareness; employee safety awareness through attitudinal and cultural interventions; Provides safety education/training to improve attitude and commitment. organizational structure; security organizational importance; Safety responsibility and accountability; Communication management behavior; employee involvement; Employee responses and behaviors can improve safety performance (Choudhry and Fang, 2008). Organizational related factors are listed below:

- Number Employees on site
- Definition of safety responsibility
- Number of safety supervisors
- Authority of safety supervisors
- Co-ordination, control and management of sub-contractors
- Involvement of top management

2.3.1 Safety Inspections

Regular safety inspections help management ensure that safe work practices are maintained. By assisting your employees with safety checks; knowledge is high and employees can learn more about safety hazards. Construction sites require constant monitoring and surveillance before safety issues arise. The use of safety checks has been shown to have a positive impact on a company's loss control initiatives. In fact, companies that conduct safety inspections have fewer accidents than companies that do not (Mohamed, 2002). Safety inspection related factors are listed below:

- Safety inspection by government Authorities
- Safety inspection by management
- Safety inspection by safety supervisor

2.3.2 Medical Facilities

The primary objective of measuring health and safety performance is to identify the strategies used to control health and safety risks; To provide information on the progress and current status of processes and activities. Health and safety is defined as the degree to which general conditions promote the completion of a project without major accidents or injuries (Sagar and Rushabh, 2017). All over the world, the construction industry is known as one of the most dangerous occupations. Medical facilities related factors are listed below:

- Availability of medical advice
- Availability of adequate facilities for first aid treatment
- Conducting periodically random drug testing

2.4 Construction and Renovation Site Safety Requirements

Construction and renovation sites are ever-changing workplaces that present unique safety challenges. Construction is considered one of the most dangerous industries worldwide (Cheng, Lin and Leu, 2010). Moreover, construction industry is one of the busiest occupations in every country and many people in every society are working in construction industry. Therefore, following safety rules and using personal protective equipment (PPE) protects workers from different hazards, workers with low education; lack of safety culture and communication are common characteristics of construction workers (Fung, Tam, and Lu, 2010).

2.4.1 Personal Protective Equipment

The purpose of personal protective equipment is to reduce personnel exposure to hazards when engineering and administrative controls are not possible to reduce these hazards to acceptable levels. PPE is required when hazards are present. For such equipment to be effective, workers must be trained in its use and the equipment must be properly fitted, inspected and maintained (Hashemi & Nikian, 1995).

To choose equipment that suits the user, consider the size, fit and weight of the PPE. If the users help choose it, they will be more likely to use it. Never allow exemptions from wearing PPE for those jobs that only take a few minutes. Occupational safety and health practices can use risk controls and interventions to mitigate.

Occupational hazards pose a threat to workers' safety and quality of life. The following are type of personal protective equipment (PPE):

(1) Protective Clothing

This form of PPE is all-encompassing and refers to various suits and uniforms worn to protect the user from harm. Prolonged exposure to occupational skin hazards such as extreme temperatures and UV rays can damage the skin. Mechanical trauma is friction, pressure Abrasion It occurs in the form of cuts and cracks. Parasites microorganisms; Biological agents such as plants and animals can have various effects when they come into contact with the skin. chemistry metal spraying; pressure leaks or sprays from spray guns; dirty dust, Impact or penetration and other skin injuries can cause contact dermatitis in construction workers; It leads to occupational diseases such as skin cancer and other infectious diseases. conventional or disposable clothing; boiler suits; dresses, chemical suits; reflective jackets and other protective clothing are worn to protect against potential chemical splashes and skin protection. In selecting materials, non-flammable, anti-static; chemically impermeable and high visibility.

(2) Eye Protection

Most eye injuries occur when solid particles such as metal slivers, wood chips, sand or cement chips get into the eye, smaller particles in smokes and larger particles, (broken glass) also account for particulate matter causing eye injuries, blunt force trauma can occur to the eye when excessive force comes into contact with the eye. Chemical burns from sources such as welding torches and ultraviolet radiation. Biological agents and thermal agents also contribute to occupational eye damage. Recommended use of eye protection varies by occupation. Safety glasses provide minimal protection from external debris, and it is recommended that side protection be provided with a surround design or side shields. Goggles provide better protection than safety glasses and are resistant to chemical cracking, impact Effective in preventing eye injuries from welding in dusty environments. Eye protection used for welding provides shade to varying degrees depending on the specific operation (ISEA, 2007).

However, the selected eye protection affects the task; dust splashing Molten metal eye protection must have the correct composition, fit the user properly and be selected based on anticipated hazards. Wear safety glasses or face shields at any time when welding; cutting Grinding nailing electrical hazards; concrete Effectively

combats potential eye hazards, such as when working with hazardous chemicals or when exposed to flying particles, which may cause foreign objects to enter the eye.

(3) Nose Protection

Construction workers are exposed to oxygen-deficient air. dust, exposure to gases and contaminated air and vapors. breathing apparatus half and masks; compressed air and self-contained breathing apparatus; dust, air filter mask, gas masks and particulate respirators should be worn (ISEA, 2007).

(4) Ear Protection

Construction noise is often overlooked as an occupational hazard because it is invisible to the eye. Very high-pitched sounds are dangerous even for short periods of time. Earplugs and semi-implantation or canal caps can be used as shields that reduce noise to an acceptable level for safety and communication. The correct hearing protection must be provided for the type of work and ensure that workers fit them properly (ISEA, 2007).

(5) Hands Protection

Construction workers are bruised; extreme temperature; cutting and piercing; damage Chemicals electric shock radiation vibration Often exposed to biological materials and prolonged immersion in water. Workers should wear the correct gloves for the job. Heavy duty rubber gloves for concrete work; welding gloves for welding; protective gloves and gloves when exposed to electrical hazards (ISEA, 2007).

(6) Safety Boots and Shoes

Safety boots and shoes with slip-resistant, puncture-resistant soles, protective toecaps and penetration-resistant, mid-sole wellington boots and specific footwear, foundry boots and chainsaw boots should be worn to reduce on-site occupational injuries (ISEA, 2007).

(7) Head Protection

Workers wear hard hats, which are prone to falling objects from above. They should wear hard hats where their heads could be hit by fixed objects or accidentally

exposed to electrical hazards. hard hats with stains, Lead caps are replaced and maintained in good condition after wind or electric shock (ISEA, 2008).

Required personal protective equipment (PPE) will be worn at all times. At a minimum, each employee is required to wear a hard hat and safety glasses. High visibility safety vests with reflective stripes are required when employees are exposed to traffic. High visibility vests should be worn at all times unless there is traffic. Additional PPE may be required depending on conditions. This determination will be made by supervisor:

a. Protective gloves
b. Hearing protection
c. Full face shields when cutting, grinding, or chipping
d. Chemical splash goggles
e. Respiratory protection
f. Other equipment such as protective clothing, fall protection when working above 6 feet, or safety-toed shoes

All workers must wear shirts with sleeves, long work pants, and sturdy work shoes or boots. Sleeveless or tank top shirts, short pants, sweat pants, sneakers, sandals, and high-heeled or open-toed shoes are not permitted.

2.4.2 Site Protection and Security

Barricades, signs, or guardrails must be used wherever necessary for the physical protection of people or property. Barriers or barriers should act as physical barriers to prevent pedestrian exposure to hazards created by construction or renovation activities (Gheradi & Nicolini, 2002).

Signs should be used to ensure safe movement of both vehicles and pedestrians in or around the workplace. Floor openings or openings higher than 4 feet must be shielded.

locking doors after working hours and whenever the site is unoccupied; Secure work areas with fencing or shielding. whenever necessary Follow check-in procedures when entering or leaving the work site.

stairs Scaffolding Powdered tools; Proficient in all tools including forklifts; It must be performed by properly trained personnel. Tools and equipment must be inspected before use and removed from service if found defective. security guards;

Equipment or features must be maintained in a fully operational state (Chhoudhry and Fang, 2008).

Follow hot work permit procedures for cutting, welding, or burning. Erect arc shields for the protection of co-workers or passers-by. Follow good housekeeping practices. At the end of each work shift, keep work areas in order and clean up work area debris. Smoking is not permitted in any site building, including construction sites, under renovation or construction or in designated areas.

2.5 Measure to Improve Workplace Safety

This topic deals with how to improve workplace safety in construction site. According to (Riddel, 2016) work place is improved through the following mechanisms.

2.5.1 Safety Awareness

Safety awareness is the practice of thinking about the possibility of injury to someone or damage to property before starting a business. Having policies and procedures is not enough. Building safety awareness is the first step in implementing a safety program. It shows that the management team cares about the health of the employees. If management communicates that security is important, employees will think so too. When safe work practices are prioritized, the results are reduced injuries and increased productivity.

Any worker, given his or her role or level of experience, must be fully aware of the potential hazards before setting foot on a construction site. Ignorant workers are perhaps the biggest risk in any business; Because their unknowing mistakes put everyone else at risk. Understanding the dangers at hand and maintaining perpetual vigilance is perhaps the number one best way to prevent accidents.

Safety awareness is the first step in implementing a successful safety program. While important in setting policies, it is not sufficient to ensure employee buy-in. Employers need to ensure that safety policies are at the forefront of employees' minds while working. Improving safety awareness shows your employees that you and other management care about their health (Diugu, Baba and Egila, 2012).

Additionally, safety awareness can reduce the risk of injury on the job. Employees should not only be knowledgeable about safety protocols, but actually follow safety procedures.

Safety awareness can be a very taxing and overwhelming task, but it is essential to maintaining and improving the safety of your workplace. Try one tip at a time to make it easier.

2.5.2 Safety Training

The construction sector is essential and an integral part of infrastructural development, which boosts our country's economy immensely. The construction industry has recorded tremendous growth worldwide in recent years. Despite the rapid development of technology in most sectors, the construction industry remains labor intensive. Construction workers are one of the most vulnerable among unorganized and unskilled workers as they face serious OHSE hazards. The fatal accident rate in this industry is 4 to 5 times that of the manufacturing sector. It is important that organizations take health and safety seriously and as part of this; They must ensure relevant and effective training for their employees.

Safety training allows people to acquire new knowledge; It is defined as the process of learning new skills and performing behaviors in new ways (Dupont, 1991). Training is 'specific skills or knowledge'; 'displayed poster'; Differences between training and development by stating that 'safety booklet production' and 'refers to development' training refers to the development of intellectual and emotional skills needed to perform better; In a particular task. Safety education and training related factors are listed below:

- Cost of the project
- Planning and scheduling of the project
- Application of new technology in construction
- Type of proprietor
- Complexity of the design

While most of a construction worker's skills can be acquired on the job, safety is a skill that is best learned before entering the construction industry. The Occupational Safety and Health Administration (OSHA) and other organizations issue pamphlets,

worksheets, They publish some resources to train their new workers about standard safety and security practices, including training videos and on-site training opportunities. Experienced workers should expect to refresh their standard safety knowledge by attending regular training throughout the year.

2.5.3 Communication

Accidents are more likely to occur when workers are unsure of what to expect. Direct communication about the day's goals and activities will minimize surprises that can harm the body. Construction companies would be wise to equip workers with devices such as smartphones or headsets that allow for quick and efficient communication between team members.

2.5.4 Documentation

Most construction companies have some legal process to start construction, and it is important to obtain all the proper registration and licenses before starting work. Supervisors and contractors who will be charged with particularly difficult tasks, such as blasting, should be sure to provide their certification in advance of their employment on the job site. This not only prevents accidents due to improper training, but also protects the construction company from legal action and public scrutiny. In addition, documenting all work in the field using cloud and mobile technology makes it easier than ever to mitigate future lawsuits.

2.5.5 Proper Equipment

Construction workers with improper gear can cause serious errors. Not only should each piece of equipment on the job site be suited to the job at hand, but construction workers must ensure that all equipment and materials are well maintained. Construction companies must also consider equipment that may not be directly involved in the construction project. Workers should have plenty of water in a shaded area to prevent dehydration and exposure-related illnesses. Longer construction projects can even benefit from fabric structures to store equipment and cover imperfect spaces.

2.5.6 Supervision

Ideally, while construction workers fully understand the negative effects of inadequate safety precautions and work to improve overall health in this way, this is not a perfect world. Every site must have a strong supervisor who is willing and able to enforce uncompromising safety standards. This officer supervises all employees on a daily basis and must correct those who fail to commit to proper safety procedures.

Construction supervisors are responsible for overseeing all on-site activities and supervising contractors and other employees in the field. In addition to traveling from one location to another, legal regulations and standards are enforced to ensure a safe and healthy working environment. A supervisor resolves any problems or obstacles in the construction process. Construction supervisors are responsible for the following tasks:

a. It is important to monitor the construction process and provide training and team building sessions to ensure compliance with health and safety regulations.
b. Perform routine site inspections and inspections of equipment, materials, and construction sites.
c. It maintains awareness of safety codes and developments in the construction industry.
d. Recruiting and training new employees
e. Inspection of documents and site visits of several projects.
f. Ensures compliance with technical standards and regulations on occupational health and safety at construction sites.
g. The applicable safety plan items are correctly and adequately applied to the workplace.
h. Be sure to train employees on proper work practices and provide technical guidance on accident prevention.

In the event of an accident at the construction site, the construction supervisor must report it to the authorities in accordance with the emergency plan. The supervisor's responsibility is to administer first aid to the injured and ensure that no further harm is caused to personnel or property (Mohammadfam & Fateni, 2008). In addition, the supervisors shall keep the accident site intact.

2.6 Occupational Safety Knowledge, Attitude and Practice of Construction Site Workers

Workers' behaviors affect their productivity and safety when working on a construction site. The safe labor practice rate measures the safety knowledge of construction workers; Attitudes and practices. The main reason is that their perception of their security may be at risk.

According to Choudhry and Fang (2008), construction workers are believed to be inferior to other employees. Causes of unsafe behaviors include lack of safety knowledge; attitudes and practice skills were also identified. Management's support and involvement and commitment to safety is a very important factor in improving safety (Mohamed, 2002). Safety management is ensured through planning, organization, and provision of safe workplace policies and procedures.

Safety procedures should be disseminated to and understood by management, engineers, supervisors and workers. Mohamed (2002) points out that regulations are an important part of safety management systems. Advising supervisors on unsafe work behavior and emotional behaviors of workers; Warning and care must be taken.

Standardized safety measures are often applied when workers are trained to be safe. Such practices may be the opposite of what is actually done. Workers' contribution and perception of safety risks is a challenge for safety measures (Chhoudhry & Fang, 2008).

New workers are more likely to have accidents than experienced workers; This can be explained through the experience they are accumulating (Chhoudhry & Fang, 2008). But it is a continuous learning process and one's perception can change with subsequent experiences.

Wilson (1989) showed that combining knowledge and experience can provide more options in solving problems. There are also many symptoms that do not necessarily affect the safety of the experience. Increasing experience reduces vigilance and increases confidence in one's ability to cope with an event (Gherardi & Nicolini, 2002).

The use of machinery and equipment is also considered a source of traffic accidents. Managers should warn or prohibit access to such high-risk areas. Wilson

(1989) states that workers learn by doing work directly based on the observation or mistakes of colleagues.

One of the problems with traditional training is that it does not represent the actual work environment. Mohamed (2002) trained skilled workers to perform specific tasks safely. However, training focuses on changing worker attitudes towards the implementation of safety measures.

2.7 Review on Previous Studies

Myo Ko (2015), found that there was a correlation between the type of employee and the attendance of occupational skills training. In this study, knowledge about safety measures; There is no correlation between attitude and practice. Most construction workers have low levels of education and training. Many workers in construction sites are exposed to significant occupational health hazards, and as a consequence, they are more susceptible to work-related illnesses. Additionally, all workers wore safety boots while working at the current study site. It may also be due to the mandatory rule that helmets and helmets must be worn. Surprisingly, there were no workers registered as social security members under this mandatory rule. Occupational hazards and frequent health lectures and more training on occupational hazards should be given to construction workers to prevent occupational accidents and injuries.

Aung Kyaw Thet (2017), studied safety management issues in construction industry. The study found that most employers in the construction industry lack knowledge in safety management. Because they organize safety management with fewer members and a budget, teams can manage effectively and mitigate later. These include safety regulations and policy; There is also a lack of training for information and technology staff and sending staff to regularly attend safety training. The study found that most employers in the construction industry lack knowledge in safety management. Because they organize safety management with fewer members and a budget, teams can manage effectively and mitigate later. Most of the safety managers/officers in the construction industry have little knowledge and experience with PPE by using it in the workplace. There is less regulation and policy to follow. Most of the workers lack safety knowledge and prefer their mental strain to saving lives.

Unskilled workers are vulnerable to hazards and should not wear PPE. Their personalities are playing horse with each other. instructions, It is often unsafe to act by misrepresenting procedures and rules.

Than Lwin (2019) states that most employers provide some safety equipment, proper maintenance of equipment and tools; It was found that the dangerous moving parts of the machine were often adequately protected. Data collected suggests that while most businesses have the required PPE available to workers, more than one-fifth of employees in the workplace do not wear PPE when required, and some factories do not routinely inspect safety equipment. Basic. Some of them are not trained in proper PPE use and are not used to take all PPE damage out of service immediately. Most industries use prohibition signs; Although they provide safety signs such as warning signs and mandatory signs, almost half of industries lack emergency escape signs in their workplaces. Some safety managers regularly hold workplace safety meetings. Almost all industries have obtained permits or licenses from the Department of Factories and General Labor Law Inspection. It is inspected annually by regulatory bodies concerned with industrial safety, such as the Fire Service Department and the Electrical Inspection Department.

Zakaria Hanida and Ezrin (2019) highlighted that there is a significant relationship between KAP and safety climate factors. This means that workers have proper knowledge of safety; supervisor's statement of attitudes and practices, if any; proactive and positive practices of workplace safety engagement will be perceived by workers. Based on the results of the survey, there are safety and health performance deficiencies. These issues include the lack of a safety and health program for employees; Inadequate training of staff on health and safety consultation; lack of safety and health policy; The company does not have a safety and health department; and lack of site security; health check lack of incentives for employees; health and safety; Finally, no temporary storage of accident records. In this study, safety awareness has proven to be a useful indicator in the workplace related to safety and security practice (KAP).

CHAPTER III
PUBLIC HOUSING CONSTRUSTION IN YANGON REGION

3.1 Rules and Regulations of Housing Construction

These rules and regulations were issued by the Yangon City Development Committee in 2020, and the construction companies in Yangon Region. Every company and building owner must comply.

Notifications from the municipality to ensure safe and quality buildings in the construction of buildings. Terms and conditions are published. Every person erecting or renovating a building within one month of the completion of the construction or reconstruction shall give written notice of such completion to the corporation and provide all necessary facilities to the Corporation. Inspection of such building.

The company shall, within seven days of receiving such notice, send a deputy officer to commence the work of inspection of the premises.

The Company shall, within seven days from the date of commencement of such examination, send a written notice to the recipient of the notice of completion at his address as stated in such notice or, if there is no such address. Affixed on a prominent part of the building to which such notice applies:

(a) give permission for occupation of the constructed building or for re-installation and use of part of the building; or

(b) refuse such permission in case such building has been erected or re-installation so as to disobey any provision.

No person occupies or permit to be occupied any such building or use or permit to be used any part of the building affected by the reconstruction:

(a) Until the approval referred to in clause (a) of sub-section (3) is obtained; or

(b) Unless the construction companies fail within twenty-one days of receipt of the notice of completion of the refusal of such consent.

If any person:

(a) Excavates or re-erects the foundations of any building or commences the work of re-erection without the permission of the Corporation; or

(b) proceeds with the work of erection or reconstruction of any building is carried out after fully complying with the legal requirements of the notification prescribed by the Corporation; or

(c) occupies or permits to be occupied or using or allowing to use or allowing to be used or using or allowing to be used any part of a building constructed or reconstructed without the consent of the company.

The following requirements are for rules and regulation of 3 story housing;

(a) Level 12 feet space in front of the building, the space in front of the building.
(b) There shall be at least 3 feet on each side of the building.
(c) There shall be at least six (6) feet at the rear of the building. If the cistern is located behind the building, leave at least one foot from the end of the building to the fence.
(d) If the building is smaller than 40 x 60 feet, each side of the building should be 1 foot from the fence.
(e) Soil test is required for buildings of 3 levels and above.

The following rules and regulations are more than 4 story housing;

(a) The whole plot can be built on in downtown; Lanmadaw, Latha, Pabedan, Kyauktada, Bohatuang, Pazundaung townships. But for the remaining townships, a 1 feet space around the building needs to remain.
(b) If a lantern is constructed in any township, it shall be placed two feet away from the fence or the foundation shall be placed 4 feet away from the fence or the instructions of the engineering department shall be followed.
(c) If the building does not have a drainage system in the back street (B.D.S), you must leave at least six feet of space for the septic tank or follow the instructions of the concerned department.
(d) An emergency ladder should be installed.
(e) Doors and windows should be fixed or slide open, leaving a one-foot space on each side of the building. If you leave three or more feet on each side of the building, you can put windows, but they remain in your area.

The height of buildings in YCDC areas has to be as follows;

(a) For residents' room – the ground floor is 10 feet high and other types of rooms are 9 feet high.

(b) Grocery shop and office – 12 feet

(c) Hotels and restaurants – 12 feet

(d) Hospitals and School rooms – 12 feet

(e) Parks – 12 feet

(f) Small industries – 14 feet

(g) Car parking – 8 feet and 6 inches

(h) If the building is six stories or more or taller than 62 feet, it must be equipped with an elevator.

(i) If the building is more than two levels high. It should have a reinforced concrete or steel structure.

(j) In order to have a good view of Shwedagon Pagoda, it is forbidden to build a building higher than six stories on each side of the road below; the east part of the Shwedagon Pagoda, Alanpya Pagoda Road, Zoological Garden Road, Kan Road, Set Yone Road, Nat Mauk Road and Kaba Aye Pagoda Roads.

(k) In Pazundaung Township, near Shwe Phone Pwint Pagoda, it is prohibited to construct buildings that may affect the scenery of the pagoda without the permission of the committee.

(l) Permission needs to be granted for the construction of 12 storey buildings with the YCDC area.

(m) Construction is not allowed on YCDC owned land.

(n) Commercial advertisements placed inside or outside the building require a tax to be paid to the YCDC.

(o) If YCDC asks for a plot on the corner of the road, the builders must show the consents of the residents of other buildings.

(p) Occasionally, the committee has the authority to permit the construction of high-rise buildings in certain areas from time to time.

The following are permission to construct a new building;

(a) Three copies of the building model and signed by a licensed engineer.

(b) Three copies of equipment list signed by a licensed engineer.

(c) The record of the land and its location as evidence of land credit issued by the relevant department;

(d) The applicant must be the owner of the land. If the owner cannot come to the office, send someone who will act as proof of land debt.

(e) Certification from the relevant township municipal administrator to show that there is no debt to be paid to the municipal welfare department;

(f) Copy of NRC of the applicant and recommendation of the concerned Ward Administrator to prove that the applicant is still alive.

(g) Copy of receipt issued on payment.

(h) If the building is a religious building, the approval of the Ministry of Religion and the District General Administration Department is required.

(i) If the building is a shop in the fence, the approval of the District General Administration Department is required.

(j) If the building is three stories or more; An original copy of the soil test and building test signed by a licensed engineer is required.

(k) Record of inspection of buildings surrounding proposed construction land.

(l) The front design of the building must be beautiful in accordance with the shape of the city. (If there is a building at the intersection, the sides and the back of the building must also be beautiful).

(m) A photograph of each old building on the proposed land and the buildings on each side;

(n) Original certification from the township authority or ward administrator that there is no dispute between the owner and tenants regarding the proposed construction plot.

3.2 History of Public Housing Sector

Public housing is supplied by the Department of Urban and Housing Development under the Ministry of Construction. The following Table (3.1) shows the history of public housing sector.

Table (3.1) History of Public Housing Sector

Year	Rental		Ownership			Total
	Rental Housing	Staff Housing	Low-cost	Mid-cost	High-cost	
1948-1962	6601	-	-	-	-	6601
1962-1988	3393	7637	-	-	-	11030
1988-2011	-	73	3448	45655	2743	51469
2011-2015	-	73	3448	45655	2743	51469
2016-2017	-	2308	1888	1792	16	6004
2017-2018	-	2310	6992	1069	1543	119214

Source: Department of Urban and Housing Development

Pyidawtha Plan (1948-1962) aimed to bring local people into development efforts. In addition to greater attention to social security issues, government structures and responsibilities at the local level have also been emphasized. Government allocations to local communities in cash. They were encouraged to supplement it with voluntary contributions of labor or materials. The plan called for coordinated and coordinated national development in all key economic and social areas. The plan includes long-term and short-term plans for land tenure as well as plans for farm expansion and diversification. These policies will be extended to the people of the mountain area. Other topics include public health support; housing assistance; Detailed plans for the development of transportation and communication; These include, among others, adult education projects that continue to the vocational levels. Pyidawtha Plan Plan objective is good roads, good railway good bridge Not only the abundance of good houses, but also class exploitation, crime disease retrogrades. The purpose of purifying the atmosphere. Exploitation

Under the Socialist Regime (1962-1988), there was no National Housing Policy (NHP) in particular, as the government did not promote home ownership, thus wiping out the private sector in the economy. The housing policy and program completely changed in its concept from the parliamentary democratic regime. The government does not promote home ownership because it does not recognize private ownership in line with socialism. Therefore, they focus on hiring civil servants with social status appropriate to the times. In addition, the private sector's supply of housing has completely diminished due to nationalization and deregulation of the private sector.

During the Military Regime (1988-2011), there was no specific NHP in the public housing sector, and practical activities were ad hoc without a long-term strategy or policy. Therefore, the provision of housing through government schemes contributes to the housing stock. With the Yangon City Development Committee Law (1990), the Tatmadaw government established and upgraded the City Development Committee to carry out all the responsibilities of Yangon's urban development. HD (Grade-B) was reorganized into DHSHD (Grade-A Department), including 5 state and regional offices. Under military rule, the government does not have a separate NHP; Plans and programs are not long-term policy and strategic plans with interim government practices.

However, DHSHD implemented several housing and urban development projects in Yangon, mainly to enhance the political image of the military councils. Regarding the housing finance policy, it is a “no profit and no loss” policy; The government budget is generally unable to subsidize and cover most expenses, particularly space and services; Public infrastructure comes from the profits of the government's commercial real estate projects. Land as “cross grant practices”.

In 2011, Myanmar experienced a dramatic transition from military rule to an elected government, a change that surprised the world community with what it called a democratization. The elected government promised to transform politics towards democracy and a market economy. political reform; economic reform; announced the implementation of four serial numbers: administrative reform and private sector reform.

The following Table (3.2) shows public housing provision (2011-2030) by Department of Urban and Housing Development (DUHD) in Myanmar.

Table (3.2) Five Year Course of Housing Provision

Plan	Year	Unit of Total Housing Provision	Unit of Housing Provision 20% by DUHD	Unit of Housing Provision 80% by PPP
First Five-Year Plan	2011-2015	0.10 million	20000	80000
Second Five-Year Plan	2016-2020	0.18 million	36000	144000
Third Five-Year Plan	2021-2025	0.30 million	60000	240000
Forth Five-Year Plan	2026-2030	0.42 million	84000	336000
Total	**2011-2030**	**1 million**	**200000**	**800000**

Source: Department of Urban and Housing Development

According to Table (3.2), to accomplish the provision of one million units, twenty percent of the project will be constructed by the Department of Urban and Housing Development (DUHD), while 80 percent will be constructed by the government and the private sector. Twenty percent of the one million housing units (ie 200,000 units) will be built within 20 years.

3.3 Status of Public Housing Present Condition in Yangon Region

Yangon, the business center of Myanmar, covers an area of 3,967.86 square miles. The population was 5.21 million in 2014 and is expected to exceed 10.79 million by 2040. The Department of Urban and Housing Development under the Ministry of Construction was opened in Yangon on May 4, 2015. 'Housing and low-cost and affordable housing to meet housing needs in urban areas.

The Government of the Republic of Myanmar has released a housing project that will focus on achieving one million housing units nationwide by 2010. This

corresponds to half of the aforementioned housing requirement. In response to the One Million Housing Project, DUHD formulated a 5-year housing plan. DUHD plans to provide 20% of the total, with 90% being low-cost housing and 10% being affordable housing. Under this scheme, DUHD will supply 7,200 units per year, of which 90% or 6,480 units will be cost-effective and 10% or 720 units will be affordable.

The following Table (3.3) shows the low-cost housing units constructed by DUHD in Yangon Region.

Table (3.3) Low-Cost Housing Units in Yangon Region

Township	Housing Project	Project Area (acre)	Total Units	Sold Units	Status
Dagon Seikkan	Yuzana Phase 1	15.8	864	284	Finished
Dagon Seikkan	Yuzana Phase 2	27	1152	487	Nearly Finished
Dagon Seikkan	Yuzana Phase 3	26	1456	0	Starting
Dagon Seikkan	Kanaung	10	852	154	Finished
Dagon Seikkan	Yoma	30.2	1920	0	60% Finished
Dagon (South)	Aung Myint Mo Phase 1	14.3	960	0	Nearly Finished
Dagon (South)	Inwa	13.1	746	0	60% Finished
Hlaing Tharyar	Shwelinpan Phase 1	9.5	496	420	Finished
Hlaing Tharyar	Shwelinpan Phase 2	7.4	504	150	Finished

Source: Department of Urban and Housing Development

Yuzana Low-Cost Housing Project (Phase I, II, III) in the compound of Yuzana Garden City Housing Estate was master planned in 2015 and implemented in 2015 with the old low-cost apartments built by Yuzana Company in 1998. - 11,540 apartments

and 750 buildings in 2008; Newly constructed low-cost housing consists of four-story, six-story buildings. There are eight and twelve story semi-detached houses. 864 in Level 1; 1,152 units were registered in Phase II and 1,456 units in Phase II. Such affordable housing is popular among people. The Yuzana Housing Project from the Union Budget covers social infrastructure, so the prices of the housing units are fair and create a pleasant living environment. YBS Bus Terminal is also equipped for public transportation. City Mart supermarket, Myathita Park There are other facilities and services like restaurants and yujana market and general hospital.

Dagon Seikkan Industrial Zone Two on Kanaung Minthagyi Road in Dagon Myothit (Seikkan) Township, Eastern District of Yangon Region, and is scheduled to be constructed in the 2022-2023 fiscal year, including 852 apartments. Each unit is 456 square feet. The housing project has the Kanaung Market complex.

Yoma Low-Cost Housing Project is located in 168 apartments built in 1920 near the Kyisu Industrial Zone on Yoma Yeiktha Road in Dagon Myothit (Seikkan) Township, Eastern District. The purpose behind this project is to rent out the properties to unauthorized tenants (squatters).

Aung Myint Mo Public Housing is located at the intersection of No. 2 Highway and Hlawga Road near Ywathagyi in Dagon Myothit (South) Township. There are public transportation and other infrastructure (water and electricity) and facilities such as parking and shops. A total of 960 apartments spread over 14.3 acres.

Inwa Housing Project aims to enable middle- and low-income people to own housing. It was built next to Ayawun Road in Dagon Myothit (South) Township, Eastern District of Yangon. It is being implemented on 13,083 acres of land including 746 apartments in Ward 66. The value of the fifth-floor apartment is 16.5 million kyats, and the value of the ground floor room is 32.5 million kyats. For a 1,175 square foot unit, the fourth-floor unit is priced at 28.5 million kyats and the ground floor is priced at 48,000 kyats.

Shwelinpan low-cost housing project enables low-income people to own housing. The pilot project of the subsidized housing project was implemented in 2013, and each unit with a ground floor of 468 square feet is priced at 12.12 million kyats. Rooms on the first floor worth 10.6 million kyats were sold on the second floor and 9.8 million kyats on the third floor. Shwelinpan Low-Cost Housing Phase One consists of

496 apartments. Phase two has 504 apartments. A religious building was also built inside the courtyard. It is also used as a community center.

The following table shows that Table (3.4) the affordable housing units constructed by DUHD in Yangon Region.

Table (3.4) Affordable Housing Units in Yangon Region

Township	Housing Project	Project Area (acre)	Total Units	Sold Units	Status
Than Lyin	Thilawar	30	240	0	30% Finished
Hlaing Tharyar	Kyan Sit Min Phase 1	52	1800	0	86% Finished
Hlaing Tharyar	Kyan Sit Min Phase 2	27	1048	0	22% Finished
Dagon (South)	Pale Mon	13	272	0	30 % Finished

Source: Department of Urban and Housing Development

The affordable Thilawa housing project is located in Southern Yangon District. Located near Thilawa Special Economic Zone and Thanlyin University of Technology in Thanlyin Township. To develop as many housing projects as possible for Thilawa Special Economic Zone. The Thilawa Housing Project under Phase One on 30 acres of land was launched on April 1, 2017, and the Thilawa Housing Project comprising 240 flats was launched in February 2020. YBS services are available within the area, and clinic and school facilities are also planned there.

Affordable Kyan Sit Min Housing Scheme operated with a revolving fund Low-cost housing, with 63 buildings with 1800 apartments on 52 acres accessing government premises and services with township hall, general public hospital, township court and township police force, is considered as Kyan Sit Min Housing Project Phase One, whereas medium-cost housing is regarded as Kyan Sit Min Housing Project Phase Two, covering 24 buildings with 1048 apartments on 27 acres of land. The Affordable Kyan Sit Min Housing Project offers cheaper rates for the apartment units under the Union Budget and it is equipped with physical and social infrastructures.

Phase I was started in 2016 and 86% completed in 2021. The apartment units were put up for sale with the housing loans of the Construction, Housing and Infrastructure Development Bank in 2018. Phase Two began in 2018. Depending completion, the apartment units were sold to the public.

Pale Mon Housing Project was implemented on 13 acres of land near the Town Center Area, Ward 65, Ward 65, Dagon City New (South) Township, Eastern District of Yangon. It is an affordable housing project. Civil servants to access this project. Priority is given to government employees and company employees. Apartments can be purchased with 50% installment and 50% housing loan from CHID Bank. There are a total of 272 apartments in the Pulay Mon housing project. Park in the housing compound. playground religious building There are infrastructure and facilities such as parking and two coffee shops.

3.4 Public Housing Rental Program in Yangon Region

Public rental housing projects started in 1951. 11 plots of public rental housing were sold to Yanking Housing. U Wisara Housing Road housing Including Wailuwan Housing and Kantawgyi Housing. In order to improve the socio-economic life of the people and create job opportunities in the construction sector, the Ministry of Construction is planning to develop the densely populated Yangon, Public rental housing projects are being implemented in Mandalay and Nay Pyi Taw.

The demand for housing in densely populated cities is increasing year by year, and more and more people are moving from one area to another in the hope of finding more job opportunities. In addition, those who cannot afford to buy a property are also suffering from rising rents in private homes.

Public housing rental programs aim to address the impact on the construction sector, create job opportunities and help families reduce apartment rental costs. Buildings built by the government for people who can't afford to buy a house. The government has invested millions of kyats in the project and hopes to recoup costs by leasing the buildings to the public for long periods. After the completion of the project, the tenants will be able to live as tenants at an affordable price.

According to the Urban and Housing Development Department's 50-year investment calculation, the rental fees are about 50,000 kyats per month. The costs of the project have not been finalized and only an estimated rental price. Each public rental housing unit will be 650 square feet. Each apartment has two bedrooms. It has a living room and a bathroom. market in the project area; school, clinic It also includes a playground and a park. Efforts will be made to make some of the completed apartments in the project area available for rent by 2022.

Applications for renting residential apartments from the Public Rental Housing Project will be officially invited from the public. Any family living in 33 townships in the Yangon Municipal Development Zone can apply. This housing project is open to everyone. Employees from this project will not be given first priority. Residents of private rental properties are required to show documentation that they currently live in the rented properties.

In 2017, the Yangon Regional Government was formed with the aim of (1) providing housing to target groups, (2) speculation of lottery winners, and (iii) establishing an adequate housing distribution system. Table (3.5) shows the number of public housing rental by Yangon Region Government.

Table (3.5) Number of Public Housing Rental by Yangon Region Government

Description	**Low-Cost Housing Units**	**Affordable Housing Units**	**Total Units**
Transfer from DUHD	823	163	986
Retransfer to another department	120	2	122
In Hand of Public Housing Delivery Committee	703	161	864

Source: Department of Urban and Housing Development

Yangon Regional Government is working to return housing and housing projects to low-income government employees and squatters on land transferred by the Department of Urban and Housing Development (DUHD). All residents must agree with DUHD to abide by 26 terms and conditions. Residents will have to pay Kyat 45,000 monthly rent and Kyat 5,000 for maintenance fee. All rents are due no later than the tenth day of the month.

CHATPER IV

SURVEY ANALYSIS

4.1 Survey Area Profile

Kyan Sit Min housing project is under construction in Hling Thayaar Township and Phase-1 of the project is 86 per cent completed according to Ministry of Construction Department of Urban and Housing Development. Kyan Sit Min Housing project will provide more than 2,000 low-cost apartments. Price of the apartments will be affordable for a moderate-income family as shown in Table (4.1).

Table (4.1) Kyan Sit Min Housing Project

Project	Type of Building	No. of Building	Total Units
Phase I	8 Unit 5 Story	19	760
	6 Unit 5 Story	16	480
	4 Unit 5 Story	28	560
Phase II	12 Unit 5 Story	10	600
	8 Unit 4 Story	14	448
Total		**87**	**2848**

Source: Survey data, 2022

The project site is on 79 acres of land in Hlinethaya Township and apartment buildings constructed will be 4 Unit 5 Story, 6 Unit 5 Story, 8 Unit 5 Story and 12 Unit 5 Story available a total of 2848 apartments. Department of Urban and Housing Development stated that construction cost of Kyan Sit Min housing project total Kyat 36,110.742 million. The low-cost apartments of Ministry of Construction Department of Urban and Housing Development will be sold to the people in a long-term instalment system arranged by Construction, Housing and Infrastructure Development Bank.

The target price of the low and affordable-cost housings was to be less than Kyat 10 million to enable the grass root people to afford it. Yangon Region Government is also searching for suitable plots of lands for the low and affordable-cost housings. A minimum down payment and an affordable monthly payment, people will have an apartment which will be completely owned after 15 years instalment payment. Yangon Region Government estimates that public servants, private company personnel as well as squatters will need more than 300,000 apartments in Yangon and the government has been seeking out ways to meet this demand.

The study method used a simple random sampling method and selected 5 companies out of 14 companies currently operating in the Kyan Sit Min Housing Project (Phase I and II). A sample of 10 percent of the total number of employees in each company with 500 or more employees was taken in the study.

The study was ethically conducted and received approval from (1) Asia Business Synergy Public Co., Ltd, (2) ATY Co., Ltd, (3) Power & Glory Co., Ltd, (4) Min Naing Co., Ltd, and (5) Ngwe Sin San Thit Co., Ltd. before conducting the survey, the data collection team explained thoroughly about the objectives of study, confirmed strictly treated their particular information as confidential and took the consent with respondents.

Table (4.2) Sample Size

Name of Company	**No. of Respondents**
Asia Business Synergy Public Co., Ltd	50
ATY Co., Ltd,	50
Power & Glory Co., Ltd	50
Min Naing Co., Ltd	50
Ngwe Sin San Thit Co., Ltd	50
Total	**250**

Source: Survey data, 2020

4.2 Survey Design

Based on the survey in the study area, issues and constraints were obtained from primary data of survey questionnaires in issues and constraints related to the safety condition at housing construction in Myanmar. The survey questionnaires used to observe the process of workplace through interview with the construction site labors and management. The survey questionnaire had multiple choice questions in which the researcher provided a choice of answers and respondents were asked to select one or more of the alternatives and dichotomous questions that had only two response alternatives. And also used five points 'Likert Scale' (Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, and strongly agree = 5).

4.3 Survey Result

The information contained in this section shows the key results are (i) characteristics of respondents, (ii) knowledge of construction site workers, (iii) attitude of construction site workers and (iv) practice of construction site workers.

4.3.1 Characteristics of Respondents

Table (4.3) shows the characteristics of 250 respondents include age, gender, education qualification, marital status, working experiences, number of family and position.

Table (4.3) Characteristics of Respondents

Description	No. of Respondents	Percentage
Age Group (Years)		
< 20	18	7.2
21 ~ 30	117	46.9
31 ~ 40	92	36.6
> 40	23	9.3
Total	**250**	**100**
Gender		
Male	215	86.0
Female	35	14.0
Total	**250**	**100**

Educational Qualification		
Primary School	157	62.8
Middle School	67	26.8
High School	20	8.0
Graduated	6	2.4
Total	**250**	**100**
Marital Status		
Single	73	29.2
Married	177	70.8
Total	**250**	**100**
Working Experience		
Less than one year	123	49.2
Between one year to five years	97	38.8
More than five years	30	12.0
Total	**250**	**100**
Position		
Site Supervisor	15	6.0
Labor Head	30	12.0
Skilled Labor	85	34.0
Unskilled Labor	120	48.0
Total	**250**	**100**

Source: Survey data, 2022

According to result of 250 respondents by age level showed that the majority of respondents were age between 21 years to 30 years and male. Mostly respondents are primary school level and married. Within the total respondents, the majority of respondents have less than one year worked experience in the construction site and unskilled workers.

4.3.2 Knowledge of Construction Site Workers

The following Table (4.4) shows the knowledge of 250 respondents about company's provision include 15 site supervisors, 30 labor heads, 85 skilled labors and 120 unskilled labors.

Table (4.4) Knowledge of Respondents about Company's Provision

Description	Yes	
	Number	%
Your company issued personal protective equipment (PPE) for workers?	85	34.0
Your company provides personal protective equipment (PPE) training program for workers?	45	18.0
Your company have a formal safety program for workers?	65	26.0
Your company have a written safety policy?	88	35.3
Your company undertake formal site safety inspections?	60	24.0
Your company have a formal first aid training program for workers?	80	32.0
Your company have a formal firefighting training program for workers?	18	7.2
Your company have a formal electrical training program for workers?	15	6.0
Does your company keep records of accidents on site?	40	16.0
Does your company have injury insurance for workers?	0	0.0
Does your company have life insurance for workers?	0	0.0
Is there construction site inspection by governmental department?	52	20.8

Source: Survey data, 2022

Most respondents said that the company has not issued personal protective equipment (PPE) for workers and has not provided personal protective equipment (PPE) training program for workers. Most respondents said that their company have not a formal safety program for workers and have not a written safety policy. And also, the company has not undertaken formal site safety inspections. Most respondents said that the company have not a formal first aid training program, firefighting training program and electrical training program for workers. And also, the company has not kept records of accidents on site. All of respondents answered that the company have not injury

insurance and life insurance for workers. Most respondents answered that there is not construction site inspection by governmental department.

As a result of the 12 questions; according to the answers of the respondents, it is found that most of them have little knowledge on the company provision. Regarding the result of Table (4.4), it is found that the support part of the company is weak. The main finding is that most of the company's support is low, so the workers' participation is low.

The following Table (4.5) shows the knowledge of respondents about construction site safety.

Table (4.5) Knowledge of Respondents about Construction Site Safety

Description	**Yes**	
	Number	**%**
Did you attend PPE training?	30	12.0
Does the supervisor check before you wear PPE?	25	10.0
Do you know how to report every accident to duty officer in construction site?	195	78.0
Do you understand the safety signs in construction site?	65	26.0
Do you know the understand of how to use machinery and equipment?	46	18.4
Do you have a safety awareness for all workers in construction site?	85	34.0
Do you understand the keep working places always clean?	160	64.0
Do you understand the dispose unnecessary things and waste properly?	195	78.0
Do you know not place items that can be dropped at a height.?	173	69.2
Do you know not to drink alcohol in the working area?	250	100.0
Do you know not to smoke in the working area?	250	100.0
Do you know the main cause of accidents on workplace is because of management error?	20	8.0
Have you attended first aid training?	35	14.0
Have you attended firefighting training?	12	4.8

Do you know use of fire-extinguishers?	67	44.8
Have you attended electrical training?	12	4.8

Source: Survey data, 2022

From Table (4.5), the majority of respondents have not attended PPE training. Most respondents said that the supervisor does not check before wear PPE and they have known to report every accident to duty officer in construction site. Most respondents have not understood the safety signs in construction site and how to use machinery and equipment. Most respondents said that they have not a safety awareness for all workers in construction site.

Most respondents have understood the keep working places always clean and the dispose unnecessary things and waste properly. Most respondents have known not to put things on height, not to drink and not to smoke in the working area. Most respondents have not known the main cause of accidents on workplace is because of management error. Most respondents have not attended first aid training, firefighting training and electrical training. And also, they have not known how to use fire-extinguishers.

In answering 16 questions, it was found that they answered that they had knowledge of 6 questions and they had little knowledge on the remaining questions. The main finding is that most of the respondents know the general points that should be known and have not attended training on the points related to the training and equipment, so it is found that the poor knowledge.

The following Table (4.6) shows the knowledge of respondents about personal protective equipment (PPE).

Table (4.6) Knowledge of Respondents about Personal Protective Equipment

Description	**Yes**	
	Number	**%**
Do you know to wear safety helmet while you are working?	208	83.2
Do you know to wear safety belt while you are working?	165	66.0
Do you know to wear safety shoes/boot while you are working?	208	83.2

Do you know to wear safety eye protection while you are working?	200	80.0
Do you know to wear safety ear protection while you are working?	185	74.0
Do you know to wear safety face protection while you are working?	170	68.0
Do you know to wear safety protective gloves while you are working?	215	86.0
Do you know to wear safety mask while you are working?	186	74.4
Do you know to wear safety protection clothing while you are working?	40	16.0

Source: Survey data, 2022

According to result of 250 respondents, most respondents have known to wear safety helmet, safety belt, safety shoes/boot, safety eye protection, safety ear protection, safety face protection, safety protective gloves and safety mask but they have not known to wear safety protection clothing while they are working. On the 9 questions, it was found that most of the respondents had knowledge about PPE.

The following Table (4.7) shows the knowledge of respondents about health hazard in construction site.

Table (4.7) Knowledge of Respondents about Health Hazard in Construction Site

Description	**Yes**	
	Number	**%**
Do you know wearing personal protective equipment (PPE) can prevent heat?	185	74.0
Do you know wearing personal protective equipment (PPE) can prevent welding and cutting lighting?	200	80.0
Do you know wearing personal protective equipment (PPE) can prevent radiation?	160	64.0
Do you know wearing personal protective equipment (PPE) can prevent dust?	182	72.8

Do you know wearing personal protective equipment (PPE) can prevent chemical?	168	67.2
Do you know wearing personal protective equipment (PPE) can prevent noise?	90	36.0
Do you know wearing personal protective equipment (PPE) can prevent vibration?	85	34.0
Do you know wearing personal protective equipment (PPE) can prevent gas?	55	22.0
Do you know wearing personal protective equipment (PPE) can prevent air pollution cause by machine & vehicle?	80	32.0

Source: Survey data, 2022

From Table (4.7), most respondents have known wearing personal protective equipment (PPE) can prevent heat, welding and cutting lighting, radiation, dust and chemical. Although, most respondents said that the personal protective equipment cannot prevent noise, vibration, gas and air pollution cause by machine & vehicle.

Out of 9 questions, it was found that most of the respondents had knowledge about 5 questions and they had no knowledge about the remaining 4 questions.

The following Table (4.8) shows the knowledge of respondents about machine and tools safety hazards.

Table (4.8) Knowledge of Respondents about Machine and Tools Safety Hazards

Description	**Yes**	
	Number	**%**
Do you know to check each tool and equipment the damage before use?	208	83.2
Do you know the heavy machine working area is restricted?	185	74.0
Do you know to do regular checkups of machinery?	25	10.0
Do you know use of automatic machine can prevent you from safety hazards?	80	32.0
Do you know use of remote control can prevent you from safety hazards?	35	14.0

Do you know only knowledge person who know how to use the mechanical appliances well should use them?	30	12.0

Source: Survey data, 2022

Regarding from 250 respondents, most respondents have checked each tool and equipment the damage before use. Most respondents have known the heavy machine working area is restricted. Most respondents answered that they have not known to do regular checkups of machinery, use of automatic machine can prevent you from safety hazards, use of remote control can prevent you from safety hazards and only knowledge person who know how to use the mechanical appliances well should use them.

Out of the 6 questions, it was found that most of the respondents had knowledge about 2 questions and had no knowledge about the remaining 4 questions.

The following Table (4.9) shows the concerning knowledge of 250 respondents about electrical safety hazards include 15 site supervisors, 30 labor heads, 85 skilled labors and 120 unskilled labors. The survey questions have two possible answers.

Table (4.9) Knowledge of Respondents about Electrical Safety Hazards

Description	**Yes**	
	Number	**%**
Check the electrical equipment.	42	16.8
Prevent electrical shocks ahead.	50	20.0
Only knowledge person to use electrical appliances	185	74.0
Do not handle electrical cables and charges with wet hands.	250	100.0
Never use damaged electrical equipment.	35	14.0
Always turn off the main switch.	185	74.0
Use rubber gloves.	37	14.7
Do not use steel ladders.	65	26.0
To reduce the risk of electric shock, disconnect before performing any electrical work.	25	10.0
Repair or replace damaged, cracked, loose, faulty power cords.	23	9.2
Keep electrical equipment away from water sources to avoid possible shock hazard.	192	76.8
Avoid overloading outlets.	20	8.0

Unplug devices when not in use to avoid risk of overheating.	40	16.0

Source: Survey data, 2022

From Table (4.9), mostly respondents are not checking the electrical equipment and preventing electrical shocks ahead. Mostly respondents said that they are doing only knowledge person to use electrical appliances. All of respondents are not handle electrical cables and charges with wet hands. Most of respondents are using damaged electrical equipment and knowing always turn off the main switch. Mostly respondents are not using rubber gloves and steel ladders. Mostly respondents are not knowing to reduce the risk of electric shock, disconnect before performing any electrical work and knowing to repair or replace damaged, cracked, loose, faulty power cords. Most respondents are keeping electrical equipment away from water sources to avoid possible shock hazard. Mostly respondents are not knowing to avoid overloading outlets. Mostly respondents are not knowing to unplug devices when not in use to avoid risk of overheating. Out of the 13 questions, it was found that most of the respondents had knowledge about 4 questions and had not knowledge about the 9 questions.

Concerning the knowledge of construction site workers such as knowledge of respondents about company's provision, safety knowledge of construction site workers, knowledge of respondent about personal protective equipment (PPE), knowledge of respondent about health hazard in construction site, knowledge of respondent about machine & tools safety hazards, and knowledge of respondent about electrical safety hazards.

According to result of knowledge of 250 construction site workers, about 20% of total respondents have knowledge on company provision, about 38% of total respondents have knowledge on construction site safety, about 89% of total respondents have knowledge on personal protective equipment, about 56% of total respondents have knowledge on health hazard in construction site, about 33% of total respondents have knowledge on machine and tools safety hazards and more than 30% of total respondents answered that they have knowledge on electrical safety hazard.

Out of 65 questions, most of the respondents answered that they do not know about 42 questions and the remaining 23 questions that they know. Therefore, most of the respondents have poor knowledge.

4.3.3 Attitude of Construction Site Workers

This section presents the attitude of construction site workers. The survey questions used five-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

The following Table (4.10) shows the attitude of 250 respondents about company's provision include 15 site supervisors, 30 labor heads, 85 skilled labors and 120 unskilled labors. The mean value is calculated form five-point Likert scale. If the mean value is < 3 showed to low attitude and the mean value > 3 showed to high attitude.

Table (4.10) Attitude of Respondents about Company's Provision

Description	**Mean**	**S.D**
The company issued personal protective equipment (PPE) for workers.	1.03	0.4
The company provides personal protective equipment (PPE) training program for workers.	1.25	0.3
The company have a formal safety program for workers.	1.05	0.2
The company have a written safety policy.	2.50	0.7
The company undertake formal site safety inspections.	2.02	0.4
The company have a formal first aid training program for workers.	1.10	0.2
The company have a formal firefighting training program for workers.	1.12	0.6
The company have a formal electrical training program for workers.	1.08	0.7
The company keep records of accidents on site.	2.25	0.3
The company have injury insurance for workers.	1.02	0.4
The company have life insurance for workers.	1.01	0.6
The construction site inspection by governmental department.	1.15	0.7
Overall mean	**1.38**	**0.5**

Source: Survey data, 2022

Regarding from Table (4.10), the overall mean value is 1.38 with standard deviation 0.5. Therefore, the overall mean value is < 3 mentioned that mostly respondents' low attitude on the company provision. From the company's provision, it was observed that most of the respondents answered that they had poor knowledge, so it was low in the attitude.

The following Table (4.11) shows the safety attitude of construction site workers. The mean value is calculated form five-point Likert scale.

Table (4.11) Safety Attitude of Construction Site Workers

Description	**Mean**	**S.D**
Attended PPE training.	1.06	0.5
Supervisor check before you wear PPE.	2.02	0.3
Every accident report to duty officer in construction site.	2.45	0.8
Understand the safety signs in construction site.	2.03	0.2
Understand of how to use machinery and equipment.	1.01	0.6
Safety awareness for all workers in construction site.	1.25	0.4
Understand the keep working places always clean.	3.48	0.5
Understand the dispose unnecessary things and waste properly.	3.62	0.6
Not place items that can be dropped at a height.	1.02	0.3
Not to drink alcohol in the working area.	1.05	0.2
Not to smoke in the working area.	1.00	0.5
Main cause of accidents on workplace is because of management error.	1.08	0.6
Attended first aid training.	1.02	0.4
Attended firefighting training.	1.07	0.3
Use of fire-extinguishers.	1.02	0.6
Attended electrical training.	1.05	0.2
Overall mean	**1.58**	**0.4**

Source: Survey data, 2022

According to result of safety attitude of construction site workers (Table 4.11), the overall mean value is 1.58 with standard deviation 0.4. Therefore, the overall mean value is < 3 indicates that most of the respondents have very low the individual safety

attitude in the working area. From the safety attitude of construction site workers, it was observed that most of the respondents answered that they had poor knowledge, so it was low in the attitude.

The following Table (4.12) shows the attitude of respondents about personal protective equipment. The mean value is calculated form five-point Likert scale.

Table (4.12) Attitude of Respondents about Personal Protective Equipment

Description	**Mean**	**S.D**
Wear safety helmet while you are working.	2.05	0.5
Wear safety belt while you are working.	1.02	0.7
Wear safety shoes/ boot while you are working.	3.16	0.2
Wear safety eye protection while you are working.	1.07	0.3
Wear safety ear protection while you are working.	1.08	0.1
Wear safety face protection while you are working	1.04	0.5
Wear safety protective gloves while you are working.	1.02	0.4
Wear safety mask while you are working.	1.35	0.2
Wear safety protection clothing while you are working.	1.80	0.1
Overall mean	**1.51**	**0.3**

Source: Survey data, 2022

From Table (41.2), the overall mean value 1.51 with standard deviation 0.3 for attitude of respondents about personal protective equipment. Therefore, the overall mean value is < 3 indicates that most of the respondents have not used personal protective equipment while they were working.

From the attitude of respondents about personal protective equipment, it was observed that most of the respondents answered that they had poor knowledge, so it was low in the attitude.

The following Table (4.13) shows the attitude of respondents about health hazards in construction site. The mean value is calculated form five-point Likert scale.

Table (4.13) Attitude of Respondents about Health Hazard in Construction Site

Description	Mean	S.D
Wearing personal protective equipment (PPE) can prevent heat.	3.16	0.2
Wearing personal protective equipment (PPE) can prevent welding and cutting lighting.	2.05	0.3
Wearing personal protective equipment (PPE) can prevent from radiation.	1.02	0.4
Wearing personal protective equipment (PPE) can prevent dust.	3.25	0.1
Wearing personal protective equipment (PPE) can prevent chemical.	3.08	0.2
Wearing personal protective equipment (PPE) can prevent noise.	1.02	0.3
Wearing personal protective equipment (PPE) can prevent from vibration.	1.06	0.4
Wearing personal protective equipment (PPE) can prevent gas.	1.05	0.2
Wearing personal protective equipment (PPE) can prevent air pollution cause by machine & vehicle.	1.12	0.5
Overall mean	**1.87**	**0.3**

Source: Survey data, 2022

From Table (4.13), the overall mean value is 1.87 with standard deviation 0.3. Therefore, the overall mean value is < 3 mentioned that most respondents have lower attitude the wearing personal protective equipment (PPE) can prevent health hazard in construction site in the study area.

From the attitude of respondents about health hazards in construction site, it was observed that most of the respondents answered that they had poor knowledge, so it was low in the attitude.

The following Table (4.14) shows the concerning attitude of respondents about machine and tools safety hazards. The mean value is calculated form five-point Likert scale.

Table (4.14) Attitude of Respondents about Machine and Tools Safety Hazards

Description	Mean	S.D
Check each tools & equipment the damage before use	3.03	0.2
Heavy machine working area is restricted.	4.15	0.5
Regular checkups of machinery.	1.08	0.3
Use of automatic machine can prevent you from safety hazards.	3.02	0.6
Use of remote control can prevent you from safety hazards.	2.05	0.5
Only knowledge person who know how to use the mechanical appliances well should use them	4.08	0.2
Overall mean	**2.90**	**0.4**

Source: Survey data, 2022

From Table (4.14), the overall mean value is 2.90 with standard deviation 0.4. Therefore, the overall mean value is < 3 showed that most of the respondents have lower attitude towards safety hazards of machine and equipment.

From the attitude of respondents about machine and tools safety hazards, it was observed that most of the respondents answered that they had poor knowledge, so it was low in the attitude.

The following Table (4.15) shows the attitude of respondents about electrical safety hazards. The mean value is calculated form five-point Likert scale.

Table (4.15) Attitude of Respondents about Electrical Safety Hazard

Description	Mean	S.D
Check the electrical equipment.	1.72	0.5
Prevent electrical shocks ahead.	2.26	0.2
Only knowledge person to use electrical appliances	4.15	0.1
Do not handle electrical cables and charges with wet hands.	3.08	0.6
Never use damaged electrical equipment.	1.28	0.3
Always turn off the main switch.	2.32	0.5
Use rubber gloves.	1.04	0.7
Use steel ladders.	1.02	0.1
To reduce the risk of electric shock, disconnect before performing any electrical work.	1.82	0.2

Overall mean	**2.08**	**0.4**

Source: Survey data, 2022

From Table (4.15), the overall mean value is 2.08 with standard deviation 0.4. Therefore, the overall mean value is < 3 indicates that most of the respondents have lower attitude on electrical safety hazard such as check the electrical equipment, prevent electrical shocks ahead, only knowledge person to use electrical appliances, not handle electrical cables and charges with wet hands, never use damaged electrical equipment, always turn off the main switch, use rubber gloves and to reduce the risk of electric shock, disconnect before performing any electrical work.

From the attitude of respondents about electrical safety hazards, it was observed that most of the respondents answered that they had low knowledge, so it was low in the attitude.

Concerning the attitude of construction site workers such as attitude of respondents about company's provision, safety attitude of construction site workers, attitude of respondent about personal protective equipment (PPE), attitude of respondent about health hazard in construction site, attitude of respondent about machine & tools safety hazards, and attitude of respondent about electrical safety hazards.

According to result of attitude of 250 construction site workers, the overall mean value is 1.38 with standard deviation 0.5 showed that the they have low on company provision, the overall mean value is 1.58 with standard deviation 0.4 showed that they have low attitude on construction site safety, the overall mean value 1.51 with standard deviation 0.3 showed that they have low on personal protective equipment, the overall mean value is 1.87 with standard deviation 0.3 showed that they have low on health hazard in construction site, the overall mean value is 2.90 with standard deviation 0.4 showed that they have low attitude on machine and tools safety hazards and the overall mean value is 2.08 with standard deviation 0.4 showed that they have low attitude on electrical safety hazard.

When asked about knowledge, the respondents answered that they had poor knowledge, and the answer about attitude was low. The overall mean value is < 3 showed that most of the respondents have low attitude on company's provision, personal safety, personal protective equipment, health hazard in construction site, machine, tools and electrical safety.

4.3.4 Practice of Construction Site Workers

This section presents the practice of construction site workers. (1 = Never, 2 = Sometimes, 3 = Always). If the mean value is < 2 showed to poor practice and the mean value ≥ 2 showed to good practice.

The following Table (4.16) shows the practice of 250 respondents about company's provision include 15 site supervisors, 30 labor heads, 85 skilled labors and 120 unskilled labors.

Table (4.16) Practice of Respondents about Company's Provision

Description	**Mean**	**S.D**
The company issued personal protective equipment (PPE) for workers.	1.02	0.14
The company provides personal protective equipment (PPE) training program for workers.	1.04	0.20
The company have a formal safety program for workers.	1.09	0.29
The company have a written safety policy.	1.32	0.71
The company undertake formal site safety inspections.	1.18	0.48
The company have a formal first aid training program for workers.	1.03	0.18
The company have a formal firefighting training program for workers.	1.12	0.38
The company have a formal electrical training program for workers.	1.02	0.14
The company keep records of accidents on site.	1.48	0.71
The company have injury insurance for workers.	1.06	0.02
The company have life insurance for workers.	1.08	0.28
The construction site inspection by governmental department.	1.14	0.45
Overall Mean	**1.13**	**0.33**

Source: Survey data, 2022

Above from Table (4.16), most of the respondents said that the company have not issued personal protective equipment, a formal safety program, low of a written safety policy, not undertaken formal site safety inspections, low keep records of accidents, no insurance and does not check safety construction site by governmental department. The overall mean value is 1.13 with standard deviation 0.33. Therefore, the

overall mean value is < 2 showed that most of the respondents have poor practice on the company provision.

According to the result from poor knowledge and low attitude on company's provision, so that the study found out most respondents have poor practice on the company's provision.

The following Table (4.17) shows the safety practice of construction site workers.

Table (4.17) Safety Practice of Construction Site Workers

Description	**Mean**	**S.D**
Attended PPE training.	1.16	0.42
Supervisor check before you wear PPE.	1.14	0.45
Every accident report to duty officer in construction site.	1.08	0.34
Understand the safety signs in construction site.	2.08	0.57
Understand of how to use machinery and equipment.	1.59	0.68
Safety awareness for all workers in construction site.	1.46	0.64
Understand the keep working places always clean.	1.58	0.76
Understand the dispose unnecessary things and waste properly.	1.22	0.57
Not place items that can be dropped at a height.	2.26	0.68
Not to drink alcohol in the working area.	1.26	0.54
Not to smoke in the working area.	1.03	0.18
Main cause of accidents on workplace is because of management error.	1.40	0.62
Attended first aid training.	1.36	0.59
Attended firefighting training.	1.29	0.57
Used of fire-extinguishers.	1.02	0.14
Attended electrical training.	1.03	0.18
Overall Mean	**1.37**	**0.50**

Source: Survey data, 2022

In the study of safety practice of construction site workers Table (4.17), most respondents have never attended PPE training. The supervisor has sometimes check before the workers to wear PPE.

Most of respondents are not attended the basic first aid training. They always report every accident to duty officer in construction site. Mostly respondents never

follow up on safety signs in construction site, follow up the keep working places always clean, follow up the dispose unnecessary things and waste properly and follow up not to put things on height. Mostly respondents have sometimes followed up not to drink alcohol in the working area but most of respondents are smoking in the working area. Most of the respondents have not a first aid training program.

The company have not a formal firefighting training program for workers and mostly respondents have not attended firefighting training. Most of respondents have not known how to use the fire-extinguishers. All of respondents said that the company have not a formal electrical training program for workers and most respondents have not attended electrical training. The overall mean value is 1.37 with standard deviation 0.50. Therefore, the overall mean value is < 2 showed that most of the respondents have poor safety practice of construction site workers.

According to the result from poor knowledge and low attitude on safety practice of construction site workers, so that the study found out most respondents have poor safety practice of construction site workers.

The following Table (4.18) shows the practice of respondents about personal protective equipment (PPE).

Table (4.18) Practice of Personal Protective Equipment (PPE)

Description	**Mean**	**S.D**
Wear safety helmet while you are working.	1.58	0.76
Wear safety belt while you are working.	1.65	0.70
Wear safety shoes/ boot while you are working.	2.06	0.75
Wear safety eye protection while you are working.	1.18	0.49
Wear safety ear protection while you are working.	1.05	0.21
Wear safety face protection while you are working.	1.26	0.56
Wear safety protective gloves while you are working.	1.35	0.61
Wear safety mask while you are working.	1.18	0.39
Wear safety protection clothing while you are working.	1.04	0.20
Overall Mean	**1.37**	**0.52**

Source: Survey data, 2022

Regarding from Table (4.19), most of the respondents are not wearing safety helmet and safety belt while they are working. Mostly respondents have sometimes to wear safety shoes/boot while they are working. Furthermore, mostly respondents are not to wear safety eye protection, safety ear protection, safety face protection, safety mask and safety protection clothing while they are working. The overall mean value is 1.37 with standard deviation 0.52. Therefore, the overall mean value is < 2 showed that most of the respondents have poor practice on personal protective equipment (PPE).

According to the result from poor knowledge and low attitude on practice of personal protective equipment (PPE), so that the study found out most respondents have low practice of personal protective equipment.

The following Table (4.19) shows the practice of respondents about machine and tools safety hazards.

Table (4.19) Practice of Respondents about Machine and Tools Safety Hazards

Description	**Mean**	**S.D**
Check each tools & equipment the damage before use.	1.08	0.27
Regular checkups of machinery.	1.06	0.24
Automatic machine can prevent you from safety hazards.	1.36	0.63
Use of remote control can prevent you from safety hazards.	1.48	0.73
Overall Mean	**1.25**	**0.45**

Source: Survey data, 2022

Result of Table (4.19), most of the respondents have not check each machine and tools in the construction site and they have not use automatic machine and remote control. The overall mean value is 1.25 with standard deviation 0.45. Therefore, the overall mean value is < 2 showed that most of the respondents have poor practice on machine and tools safety hazards.

According to the result from poor knowledge and low attitude on practice of machine and tools safety hazard, so that the study found out most respondents have low practice of machine and tools safety hazard.

The following Table (4.20) shows the practice of respondents about electrical safety hazard.

Table (4.20) Practice of Respondents about Electrical Safety Hazard

Description	Mean	S.D
Check the electrical equipment.	1.10	0.30
Prevent electrical shocks ahead.	1.05	0.21
Only knowledge person to use electrical appliances	1.22	0.54
Handle electrical cables and charges with wet hands.	1.16	0.42
Never use damaged electrical equipment.	1.26	0.54
Always turn off the main switch.	1.82	0.74
Use rubber gloves.	1.40	0.63
Use steel ladders.	1.22	0.50
To reduce the risk of electric shock, disconnect before performing any electrical work.	1.20	0.40
Overall Mean	**1.27**	**0.48**

Source: Survey data, 2022

In the study of respondents practice on electricity safety hazard (Table 4.20), most of the respondents have never check the electrical equipment, not preventing electrical shocks ahead, and not practicing only knowledge person to use electrical appliances. Mostly respondents are taking electrical cables and charges with wet hands and using damaged electrical equipment but they have sometimes turn off the main switch. Most of the respondents have not use rubber gloves and they have not used steel ladders. Mostly respondents have not reduced the risk of electric shock, disconnect before performing any electrical work.

The overall mean value is 1.27 with standard deviation 0.48. Therefore, the overall mean value is < 2 showed that most of the respondents have poor practice on electricity safety hazards. According to the result from poor knowledge and low attitude on practice of electrical safety hazard, so that the study found out most respondents have low practice of electrical safety hazard. The overall mean value is < 2 showed that they have poor practice safety of construction site such as the company provision, safety practice of construction worker, personal protective equipment, machine, tool and electrical safety conditions.

Overall, according to the findings of this study, most respondents did not show clearly favorable on knowledge, attitude and practice toward the safety of construction site in Kyan Sit Min Housing Project.

CHAPTER V

CONCLUSION

5.1 Findings

The study is conducted on 250 workers the knowledge, attitude and practice of safety condition for construction site workers and to assess the use of safety materials and personal protective equipment (PPE) among construction site workers at Kyan Sit Min Housing Project.

The majority of respondents were age between 21 years to 30 years and male. Mostly respondents are primary school level and married. Within the total respondents, the majority of respondents have less than one year worked experience in the construction site and unskilled workers.

According to result of safety knowledge on construction site, about 20% of total respondents have knowledge on company provision, about 38% of total respondents have knowledge on construction site safety, about 89% of total respondents have knowledge on personal protective equipment, about 56% of total respondents have knowledge on health hazard in construction site, about 33% of total respondents have knowledge on machine and tools safety hazards and more than 30% of total respondents answered that they have knowledge on electrical safety hazard.

In the study to attitude of construction site workers, most of the respondents have lower attitude because they have poor knowledge. The overall mean value is less than 3 showed that most of the respondents have low attitude on company's provision, personal safety, personal protective equipment, health hazard in construction site, machine, tools and electrical safety.

The overall mean value is < 2 showed that they have poor practice safety of construction site such as the company provision, safety practice of construction worker, personal protective equipment, machine, tool and electrical safety conditions because they have poor knowledge and lower attitude.

Overall, according to the findings of this study, most respondents did not show clearly favorable on knowledge, attitude and practice toward the safety of construction site in Kyan Sit Min Housing Project.

There has no first aid kits and accident record in all companies. All companies have fire extinguishers without regular checking record. There has no first aid kits and accident record in all companies. All companies have fire extinguishers without regular checking record. Lack of proper information and ignorance are also to blame for the poor safety measures in construction sites.

Some workers felt that the safety equipment such as hard helmets and reinforced boots are too cumbersome and uncomfortable. Chemical substances are a major health hazards since there are many chemicals used in the construction industry. Cement mixes is also a well-known cause of skin disease.

The study found that most of the employers and workers are lack of safety knowledge and prefer their emotional stress over saving lives. And also, the construction companies are not issued PPE by using at workplace and no rules and regulation for safety in the construction site.

Workers were found untrained, unskilled and uninformed about safety measures and equipment's to be used. Workers were found unaware of the type of accidents. Workers were found being careless with use of safety equipment.

Employers were found giving less priority to safety and safety management. Employers hesitate to invest extra amount of money for safety equipment. Programs of safety training and safety awareness were not found to be conducted. Equipment to proper extent were not provided.

The construction site employers are low to follow the rules and policy. As they have few members and budget, they are not professional in their job. They are also low to follow both government and their companies' rules and policy.

The construction site manager cannot explain exactly about the PPE because they have lack of knowledge and experience on PPE by using at workplace. Most of them have only academic way. At the same time companies/employers do not provided PPE in fulfill. They should learn for using PPE help enhancing safety and would not compromise efficiency of workers, and they should be practicing that using PPE would affect efficiency of the work.

A few amounts of company take workplace safety training. The unskilled labors are not checking machine, tools and electrical equipment. Provision for safety awards and safety supervisors were not found.

There are less safety regulations and those present were also not found to be implemented at the site. The present safety conditions of the Myanmar construction industry are in a terrible condition and construction companies.

5.2 Suggestions

The major problem related to the safety issue in construction sites is the knowledge of the workers. Therefore, higher education is knowledge. It is associated with good attitudes and habits. Construction safety management addresses the activities that safety officers can perform at all levels to create an organizational setting that trains and motivates employees to perform safe and productive construction work.

The study suggests that companies/employers need to assess occupational hazards to identify the correct type of PPE to match the risk. The level of risk must be assessed to determine the required performance of the PPE. Safety assessment in the construction industry is an important measure to reduce accidents and injuries. Employers need to assess the safety hazards that workers and other construction workers may be exposed to. They should not miss the workplace and safety in their jobs. For safety issues at all sites, companies/employers have to spend more budget to properly control and manage the safety of the sites and have safety zones.

Workers should use PPE properly whenever it is necessary to use it. Any defects or damage to PPE should be reported immediately and any training or instructions given on the PPE should be included. Collapses are a major cause of construction accidents. Therefore, proper safety zones should be placed around construction sites to prevent materials from falling. Employers must provide handrails for working at height. Safety nets and catch nets must be provided.

Safety signs and signals are one of the primaries means of communicating safety information. traditional signs such as prohibition signs; fire exit signs; Fire alarms (fire drills) and fire extinguishers are considered safety features. Signs should be large enough to be easily seen and understood in the workplace. Too many signs can cause confusion or risk losing sight of important information.

Construction sites are dangerous places and first aid and rescue equipment should always be available. An accident book should be kept in which all types of minor injuries such as accidents resulting in disability and death are recorded.

Construction employers should plan to provide information and techniques in safety management that apply to the safety and health of workers in the workplace. They discuss previous cases; It should be prepared for renewal and review. Extra money should be allocated for safety equipment to prevent big losses in the future.

Safety training plays an important role in promoting safety in the construction industry. Construction employers must provide safety training; PPE; safety signs; Providing machine guarding or general safety maintenance. You should be aware of the types of accidents and should be informed about the use of the equipment. Appropriate safety equipment should be provided. Security supervisors should be in place.

Training provides workers with ways to obtain additional information about potential hazards and their controls. Gain skills to take a more active role in implementing risk control programs or to effect organizational changes that improve workplace safety. Employees must be given safety induction training when they start work. Basics like first aid and fire safety should be covered.

Construction sites adversely affect human life and health. The construction industry needs to take health and safety standards seriously and without compromise. Construction sites are dangerous places and first aid and rescue equipment should always be available. An accident book should be kept in which all types of minor injuries such as accidents resulting in disability and death are recorded. Considering the adverse effects of accidents, construction site health and safety management is a real concern for all employers in the construction industry.

Every company must have an occupational hazard record and risk management plan. A risk management plan has five steps to reduce risk: preparation; risk identification; risk assessment; risk control; Keeping and reviewing worker safety and health records in the workplace. Accidents not only cause a lot of pain and suffering, but also affect productivity. This affects quality and time, negatively impacts the environment, and consequently increases construction costs.

It is very important to select only experienced workers for constructions higher than three or four stories. Experienced workers are required to undergo a medical examination. Care should be taken to avoid things that can cause damage. All of these must be planned well in advance of construction projects.

According to this study, it is found that safety program is very rare in construction companies. Compliance with the safety program is assumed to cost more. Some people think that this kind of project takes unnecessary time. Some people think that having a construction safety program is extra work.

If the above points are strictly followed, construction sites will be safe. All of these plans are not only for one person, but for the safety of all those involved in the construction zone, to be aware of each other as necessary in order to promptly correct any defects in the construction site. To discuss and share knowledge and knowledge for their safety in order to ensure reasonable safety in construction sites.

Government departments have safety requirements before issuing building permits and provide some training on broadcasting in government media such as government media; If any company fails to comply with the restrictive regulations, the consequences or penalties must be passed on to the construction leaders.

The government needs to establish a safety department under the control of the Ministry of Construction to manage the safety issues of all companies in the construction industry. The government has already shown that regulations for the construction industry and the causes of accidents. So all companies must follow in their work. All companies have a workplace safety policy; regulations, Procedures and instructions must be followed.

As more and more construction sites are going to be implemented in Myanmar now and in the future, more emphasis must be placed on improving the current poor conditions of the workplace safety of those involved in Myanmar's construction industry.

Nowadays, international construction companies are coming to invest in Myanmar. They are actually trained to keep workers safe. Therefore, local construction companies need to do more training than before for safety, and the cost. Time. In order to reduce money and daily fatigue or loss of life and property of workers. .

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APPENDIX

SURVEY QUESTIONNAIRE

I am studying Master of Public Administration at Yangon University of Economics. I have designed the following questionnaire for "**An Analysis on Safety Condition at Construction Industry in Myanmar (Case Study: Kyan Sit Min Housing Project, Hlaing Tharyar Township)**" - which requires for my thesis work as an integral part of the study to complete the Master Program.

I would appreciate if you filled out this short survey and answer as honestly as possible. Please put a ☑ in the relevant square given. **Your responses will be kept confidential**. Please note that by continuing on, you are consenting that you are willingly participating.

I would highly appreciate if your answer the following questionnaire. It will take approximately 15 to 20 minutes. I expect your kind cooperation in this respect. Thanks for your time.

Name of the construction company _____

Part (A) Characteristics of Respondent

1. Age _____ Years
2. Gender (a) Male ☐ (b) Female ☐
3. Educational Qualification
   (a) Primary School ☐ (b) Middle School ☐ (c) High School ☐
   (d) Undergraduate ☐ (e) Graduate ☐ (f) Diploma ☐ (g) Master/PhD ☐
4. Marital Status (a) Single ☐ (b) Married ☐ (c) Widow ☐ (d) Divorced ☐
5. How long do you work in this construction company?
   (a) Less than one year ☐ (b) One year to five years ☐
   (c) More than five years ☐
6. Position
   (a) Site Supervisor (b) Labor Head (c) Skilled Labor (d) Unskilled Labor

Part (B) Knowledge of Construction Site Workers

I. Knowledge of Respondent about Company's Provision

No.	Description	Yes	No
1	Your company issued personal protective equipment (PPE) for workers?		
2	Your company provides personal protective equipment (PPE) training program for workers?		
3	Your company have a formal safety program for workers?		
4	Your company have a written safety policy?		
5	Your company undertake formal site safety inspections?		
6	Your company have a formal first aid training program for workers?		
7	Your company have a formal firefighting training program for workers?		
8	Your company have a formal electrical training program for workers?		
9	Does your company keep records of accidents on site?		
10	Does your company have injury insurance for workers?		
11	Does your company have life insurance for workers?		
12	Is there construction site inspection by governmental department?		

II. Safety Knowledge of Construction Site Workers

No.	Description	Yes	No
1	Did you attend PPE training?		
2	Does the supervisor check before you wear PPE?		
3	Do you know how to report every accident to duty officer in construction site?		
4	Do you understand the safety signs in construction site?		
5	Do you know the understand of how to use machinery and equipment?		
6	Do you have a safety awareness for all workers in construction site?		
7	Do you understand the keep working places always clean?		

8	Do you understand the dispose unnecessary things and waste properly?		
9	Do you know not place items that can be dropped at a height?		
10	Do you know not to drink alcohol in the working area?		
11	Do you know not to smoke in the working area?		
12	Do you know the main cause of accidents on workplace is because of management error?		
13	Have you attended first aid training?		
14	Have you attended firefighting training?		
15	Do you know use of fire-extinguishers?		
16	Have you attended electrical training?		

III. Knowledge of Respondent about Personal Protective Equipment (PPE)

No.	Description	Yes	No
1	Do you know to wear safety helmet while you are working?		
2	Do you know to wear safety belt while you are working?		
3	Do you know to wear safety shoes/boot while you are working?		
4	Do you know to wear safety eye protection while you are working?		
5	Do you know to wear safety ear protection while you are working?		
6	Do you know to wear safety face protection while you are working?		
7	Do you know to wear safety protective gloves while you are working?		
8	Do you know to wear safety mask while you are working?		
9	Do you know to wear safety protection clothing while you are working?		

IV. Knowledge of Respondent about Health Hazard in Construction Site

No.	Description	Yes	No
1	Do you know wearing personal protective equipment (PPE) can prevent heat?		

2	Do you know wearing personal protective equipment (PPE) can prevent welding and cutting lighting?		
3	Do you know wearing personal protective equipment (PPE) can prevent radiation?		
4	Do you know wearing personal protective equipment (PPE) can prevent dust?		
5	Do you know wearing personal protective equipment (PPE) can prevent chemical?		
6	Do you know wearing personal protective equipment (PPE) can prevent noise?		
7	Do you know wearing personal protective equipment (PPE) can prevent vibration?		
8	Do you know wearing personal protective equipment (PPE) can prevent gas?		
9	Do you know wearing personal protective equipment (PPE) can prevent air pollution cause by machine & vehicle?		

V. Knowledge of Respondent about Machine & Tools Safety Hazards

No	Description	Yes	No
1	Do you know to check each tool and equipment the damage before use?		
2	Do you know the heavy machine working area is restricted?		
3	Do you know to do regular checkups of machinery?		
4	Do you know use of automatic machine can prevent you from safety hazards?		
5	Do you know use of remote control can prevent you from safety hazards?		
6	Do you know only knowledge person who know how to use the mechanical appliances well should use them?		

VI. Knowledge of Respondent about Electrical Safety Hazards

No	Description	Yes	No
1	Check the electrical equipment.		
2	Prevent electrical shocks ahead.		
3	Only knowledge person to use electrical appliances		
4	Do not handle electrical cables and charges with wet hands.		
5	Never use damaged electrical equipment.		
6	Always turn off the main switch.		
7	Use rubber gloves.		
8	Do not use steel ladders.		
9	To reduce the risk of electric shock, disconnect before performing any electrical work.		
10	Repair or replace damaged, cracked, loose, faulty power cords.		
11	Keep electrical equipment away from water sources to avoid possible shock hazard.		
12	Avoid overloading outlets.		
13	Unplug devices when not in use to avoid risk of overheating.		

Part (C) Attitude of Construction Site Workers

(1) Strongly Disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

I. Attitude of Respondent about Company's Provision

No.	Description	1	2	3	4	5
1	The company issued personal protective equipment (PPE) for workers.					
2	The company provides personal protective equipment (PPE) training program for workers.					
3	The company have a formal safety program for workers.					
4	The company have a written safety policy.					
5	The company undertake formal site safety inspections.					
6	The company have a formal first aid training program for workers.					
7	The company have a formal firefighting training program for workers.					
8	The company have a formal electrical training program for workers.					
9	The company keep records of accidents on site.					
10	The company have injury insurance for workers.					
11	The company have life insurance for workers.					
12	The construction site inspection by governmental department.					

II. Safety Attitude of Construction Site Workers

No.	Description	1	2	3	4	5
1	Attended PPE training.					
2	Supervisor check before you wear PPE.					
3	Every accident report to duty officer in construction site.					
4	Understand the safety signs in construction site.					
5	Understand of how to use machinery and equipment.					
6	Safety awareness for all workers in construction site.					
7	Understand the keep working places always clean.					
8	Understand the dispose unnecessary things and waste properly.					
9	Not place items that can be dropped at a height.					
10	Not to drink alcohol in the working area.					
11	Not to smoke in the working area.					
12	Main cause of accidents on workplace is because of management error.					
13	Attended first aid training.					
14	Attended firefighting training.					
15	Use of fire-extinguishers.					
16	Attended electrical training.					

III. Attitude of Respondent about Personal Protective Equipment (PPE)

No	Description	1	2	3	4	5
1	Wear safety helmet while you are working.					
2	Wear safety belt while you are working.					
3	Wear safety shoes/ boot while you are working.					
4	Wear safety eye protection while you are working.					
5	Wear safety ear protection while you are working.					
6	Wear safety face protection while you are working					
7	Wear safety protective gloves while you are working.					
8	Wear safety mask while you are working.					
9	Wear safety protection clothing while you are working.					
10	Wear safety helmet while you are working.					
11	Wear safety belt while you are working.					
12	Wear safety shoes/ boot while you are working.					

IV. Attitude of Respondent about Health Hazard in Construction Site

No	Description	1	2	3	4	5
1	Wearing personal protective equipment (PPE) can prevent heat.					
2	Wearing personal protective equipment (PPE) can prevent welding and cutting lighting.					
3	Wearing personal protective equipment (PPE) can prevent from radiation.					
4	Wearing personal protective equipment (PPE) can prevent dust.					
5	Wearing personal protective equipment (PPE) can prevent chemical.					
6	Wearing personal protective equipment (PPE) can prevent noise.					
7	Wearing personal protective equipment (PPE) can prevent from vibration.					
8	Wearing personal protective equipment (PPE) can prevent gas.					
9	Wearing personal protective equipment (PPE) can prevent air pollution cause by machine & vehicle.					

V. Attitude of Respondent about Machine & Tools Safety Hazards

No	Description	1	2	3	4	5
1	Check each tools & equipment the damage before use					
2	Heavy machine working area is restricted.					
3	Regular checkups of machinery.					
4	Use of automatic machine can prevent you from safety hazards.					
5	Use of remote control can prevent you from safety hazards.					
6	Only knowledge person who know how to use the mechanical appliances well should use them					

VI. Attitude of Respondent about Electrical Safety Hazard

No	Description	1	2	3	4	5
1	Check the electrical equipment.					
2	Prevent electrical shocks ahead.					
3	Only knowledge person to use electrical appliances					
4	Do not handle electrical cables and charges with wet hands.					
5	Never use damaged electrical equipment.					

6	Always turn off the main switch.					
7	Use rubber gloves.					
8	Use steel ladders.					
9	To reduce the risk of electric shock, disconnect before performing any electrical work.					

Part (D) Practice of Construction Site Workers

(1) Never (2) Sometimes (3) Always

I. Practice of Respondent about Company's Provision

No.	Description	1	2	3
1	The company issued personal protective equipment (PPE) for workers.			
2	The company provides personal protective equipment (PPE) training program for workers.			
3	The company have a formal safety program for workers.			
4	The company have a written safety policy.			
5	The company undertake formal site safety inspections.			
6	The company have a formal first aid training program for workers.			
7	The company have a formal firefighting training program for workers.			
8	The company have a formal electrical training program for workers.			
9	The company keep records of accidents on site.			
10	The company have injury insurance for workers.			
11	The company have life insurance for workers.			
12	The construction site inspection by governmental department.			

II. Safety Practice of Construction Site Workers

No.	Description	1	2	3
1	Attended PPE training.			
2	Supervisor check before you wear PPE.			
3	Every accident report to duty officer in construction site.			
4	Understand the safety signs in construction site.			

5	Understand of how to use machinery and equipment.			
6	Safety awareness for all workers in construction site.			
7	Understand the keep working places always clean.			
8	Understand the dispose unnecessary things and waste properly.			
9	Not place items that can be dropped at a height.			
10	Not to drink alcohol in the working area.			
11	Not to smoke in the working area.			
12	Main cause of accidents on workplace is because of management error.			
13	Attended first aid training.			
14	Attended firefighting training.			
15	Used of fire-extinguishers.			
16	Attended electrical training.			

III. Practice of Respondent about Personal Protective Equipment (PPE)

No	Description	1	2	3
1	Wear safety helmet while you are working.			
2	Wear safety belt while you are working.			
3	Wear safety shoes/ boot while you are working.			
4	Wear safety eye protection while you are working.			
5	Wear safety ear protection while you are working.			
6	Wear safety face protection while you are working.			
7	Wear safety protective gloves while you are working.			
8	Wear safety mask while you are working.			
9	Wear safety protection clothing while you are working.			

IV. Practice of Respondent about Machine & Tools Safety Hazards

No	Description	1	2	3
1	Check each tools & equipment the damage before use.			
2	Regular checkups of machinery.			
3	Automatic machine can prevent you from safety hazards.			
4	Use of remote control can prevent you from safety hazards.			

V. Practice of Respondent about Electrical Safety hazard

No	Description	**1**	**2**	**3**
1	Check the electrical equipment.			
2	Prevent electrical shocks ahead.			
3	Only knowledge person to use electrical appliances			
4	Handle electrical cables and charges with wet hands.			
5	Never use damaged electrical equipment.			
6	Always turn off the main switch.			
7	Use rubber gloves.			
8	Use steel ladders.			
9	To reduce the risk of electric shock, disconnect before performing any electrical work.			

Thanks for participation.